^{49}Ti(γ,γ′),(γ,n) 1988BeYX,1981Be44,1976Ra03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	T. W. Burrows[a]	NDS 109, 1879 (2008)	14-Jul-2008

1976Ra03: bremsstrahlung. Measured σ(96°,126°) and linear polarization (Ge(Li),Compton pol).
1981Be44: Eγ=8844 from Cr(n,γ). Measured γ's, $\gamma(\theta)$, and γ linear polarization (NaI,Ge(Li),Compton pol) and N′s and σ_n(THETA) (^{3}He); FWHM=24 keV for E(n)=1 MeV.
1988BeYX: Eγ=8844 from Cr(n,γ). Measured γ's.
All data and arguments are from 1981Be44, except As noted. 1981Be44 did not attempt to extract any new states In ^{49}Ti. Others: see 1995Bu23.

^{49}Ti Levels

$\Gamma_{\gamma 0}$, Γ_γ, Γ_n for 8885 resonance: from measurements of the temperature variation of the scattering cross section, the absolute σ_γ, the absolute σ_n, the nuclear self absorption, and Γ/Γ_γ (1981Be44, 1978Mo31, 1970Mo26). 1981Be44 note that the small value for Γ_n May Be explained by considering the transmission coefficients for L=4 neutrons.

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	Comments
0	7/2$^-$		
1380.9 *24*	3/2$^-$		
1542 *3*	11/2$^-$		
1587 *3*	3/2$^-$		
1625.9 *21*	(5/2)$^-$[@]	38 fs *5*	
1761.0 *21*	5/2$^-$	25 fs *3*	J$^\pi$: 5/2,9/2 from primary $\gamma(\theta)$.
2264.2 *21*	(5/2)$^-$		
2474.0 *21*	(5/2)$^-$		
2519.8 *19*			J$^\pi$: 5/2,9/2 from primary $\gamma(\theta)$. Probable doublet; see Adopted Levels.
3440 *3*	(7/2$^-$,9/2$^-$)[@]		
3511 *6*	5/2$^-$		
3606 *3*	(5/2)$^+$[@]		
3702.4 *21*	(5/2,7/2,9/2)[@]		
3750 *4*	[@]		see discussion In Adopted Levels.
3786.1 *21*	5/2$^-$,7/2$^-$[@]		indicated As possible doublet by 1981Be44.
3847 *3*	5/2$^-$		
3942.7 *21*	(5/2,7/2,9/2)[@]		
4077 *3*	5/2$^-$,7/2$^-$		
4146 *3*	(5/2$^-$)[@]		
4245 *3*	7/2$^-$		J$^\pi$: 7/2 from primary $\gamma(\theta)$.
4510 *3*	5/2$^+$[@]		
8884.8 *11*	7/2$^+$[&]	2.29 eV *43*	$\Gamma_{\gamma 0}$=0.353 eV *31*; Γ_γ=2.04 eV *42*; Γ_n=0.25 eV *5* T$_{1/2}$: from $\Gamma_\gamma+\Gamma_n$ (evaluator). $\Gamma_{\gamma 0}$,Γ_γ,Γ_n: $\Gamma_{\gamma 0}$ is the weighted av (INT.) of 0.33 eV *4* (1981Be44) and 0.39 eV *5* (1988BeYX) and Γ_γ, 2.54 eV *80* (1981Be44) and 1.85 eV *50* (1988BeYX). See also discussion above. 726, L=4, neutron group to ^{48}Ti g.s..
9720?			weak 582 neutron group ascribed to transition to the 983-keV state In ^{48}Ti; induced by a 9720γ from Cr(n,γ).

[†] Calculated by the evaluator using least-squares adjustment procedures, except for 9.72-MeV state.
[‡] From the Adopted Levels. Supporting evidence from this reaction is given As comments and footnotes.
[#] From 1976Ra03 (assuming J=9/2 and 5/2, respectively, for the 1.62- and 1.76-MeV states), except for the Γ of 8884 state.

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^{49}Ti(γ,γ'),(γ,n) 1988BeYX,1981Be44,1976Ra03 (continued)

^{49}Ti Levels (continued)

@ 5/2,7/2,9/2 if primary γ is dipole.
& J=7/2 from 8884$\gamma(\theta)$; π=+ from E1 γ to 7/2$^-$. σ_n(THETA) consistent with theory for 7/2−(E1)7/2+(L=4)0$^+$, confirming assignment.

$\gamma(^{49}Ti)$

Possible 3917γ observed by 1976Ra03 not confirmed by 1981Be44.

E(D) 1981Be44	TV 1988BeYX	Weighted average (internal) of the following transition energies: 1981Be44	1988BeYX	1981Be44	1988BeYX
4374 3	4375 5	5037 3	5040 5	6410 3	6412 5
4516 3	4522 5	5098 3	5100 5	6620 3	6620 5
4639 3	4640 5	5182 3	5182 5	7123 3	7124 5
4739 3	4739 5	5270 3	5264 5	7258 3	7260 5
4808 3	4805 5	5445 3	5443 5	8884 3	8884 2
4942 3	4040 5	6364 3	6376 5		

E_γ	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡
1139 3		2519.8		1380.9	3/2$^-$	
1381 3		1380.9	3/2$^-$	0	7/2$^-$	
1542 3		1542	11/2$^-$	0	7/2$^-$	
1587 3		1587	3/2$^-$	0	7/2$^-$	
1626 3		1625.9	(5/2)$^-$	0	7/2$^-$	D+Q
1761 3		1761.0	5/2$^-$	0	7/2$^-$	D+Q
2264 3		2264.2	(5/2)$^-$	0	7/2$^-$	
2474 3		2474.0	(5/2)$^-$	0	7/2$^-$	
2520 3		2519.8		0	7/2$^-$	
x3079 3						
x3231 3						
3702 3		3702.4	(5/2,7/2,9/2)	0	7/2$^-$	
3786 3		3786.1	5/2$^-$,7/2$^-$	0	7/2$^-$	
3942 3		3942.7	(5/2,7/2,9/2)	0	7/2$^-$	
x4295 3						
4374 3	4.0# 8	8884.8	7/2$^+$	4510	5/2$^+$	
x4415 3						
x4499 3						
x4518 3	3.0# 6					
x4590 3						
4639 3	9.0# 18	8884.8	7/2$^+$	4245	7/2$^-$	D
4739 3	1.0# 2	8884.8	7/2$^+$	4146	(5/2$^-$)	
x4782 3	1					
4807 3	3.0# 6	8884.8	7/2$^+$	4077	5/2$^-$,7/2$^-$	
4942 3	6.0# 12	8884.8	7/2$^+$	3942.7	(5/2,7/2,9/2)	
5038 3	2.0# 2	8884.8	7/2$^+$	3847	5/2$^-$	
5098 3	8.0# 16	8884.8	7/2$^+$	3786.1	5/2$^-$,7/2$^-$	
5135 3	2	8884.8	7/2$^+$	3750		
5182 3	10.0# 20	8884.8	7/2$^+$	3702.4	(5/2,7/2,9/2)	
5268 3	1.0# 2	8884.8	7/2$^+$	3606	(5/2)$^+$	
5374# 5	1.0# 2	8884.8	7/2$^+$	3511	5/2$^-$	
5444 3	4.0# 8	8884.8	7/2$^+$	3440	(7/2$^-$,9/2$^-$)	
6365 3	7.0# 14	8884.8	7/2$^+$	2519.8		D

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^{49}Ti(γ,γ′),(γ,n) 1988BeYX,1981Be44,1976Ra03 (continued)

γ(^{49}Ti) (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]
6410 *3*	3.0[#] *6*	8884.8	$7/2^+$	2474.0	$(5/2)^-$	
6620 *3*	1.0[#] *2*	8884.8	$7/2^+$	2264.2	$(5/2)^-$	
7123 *3*	16[#] *3*	8884.8	$7/2^+$	1761.0	$5/2^-$	D
7258 *3*	2.0[#] *4*	8884.8	$7/2^+$	1625.9	$(5/2)^-$	
8884 *2*	100[#@] *20*	8884.8	$7/2^+$	0	$7/2^-$	E1[&]

[†] Relative photon intensity normalized to 100 for resonantly scattered 8844γ.
[‡] From γ(θ), except As noted.
[#] From 1988BeYX.
[@] See discussion In the Adopted Gammas.
[&] From linear polarization and γ(θ).
[x] γ ray not placed in level scheme.

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Level Scheme

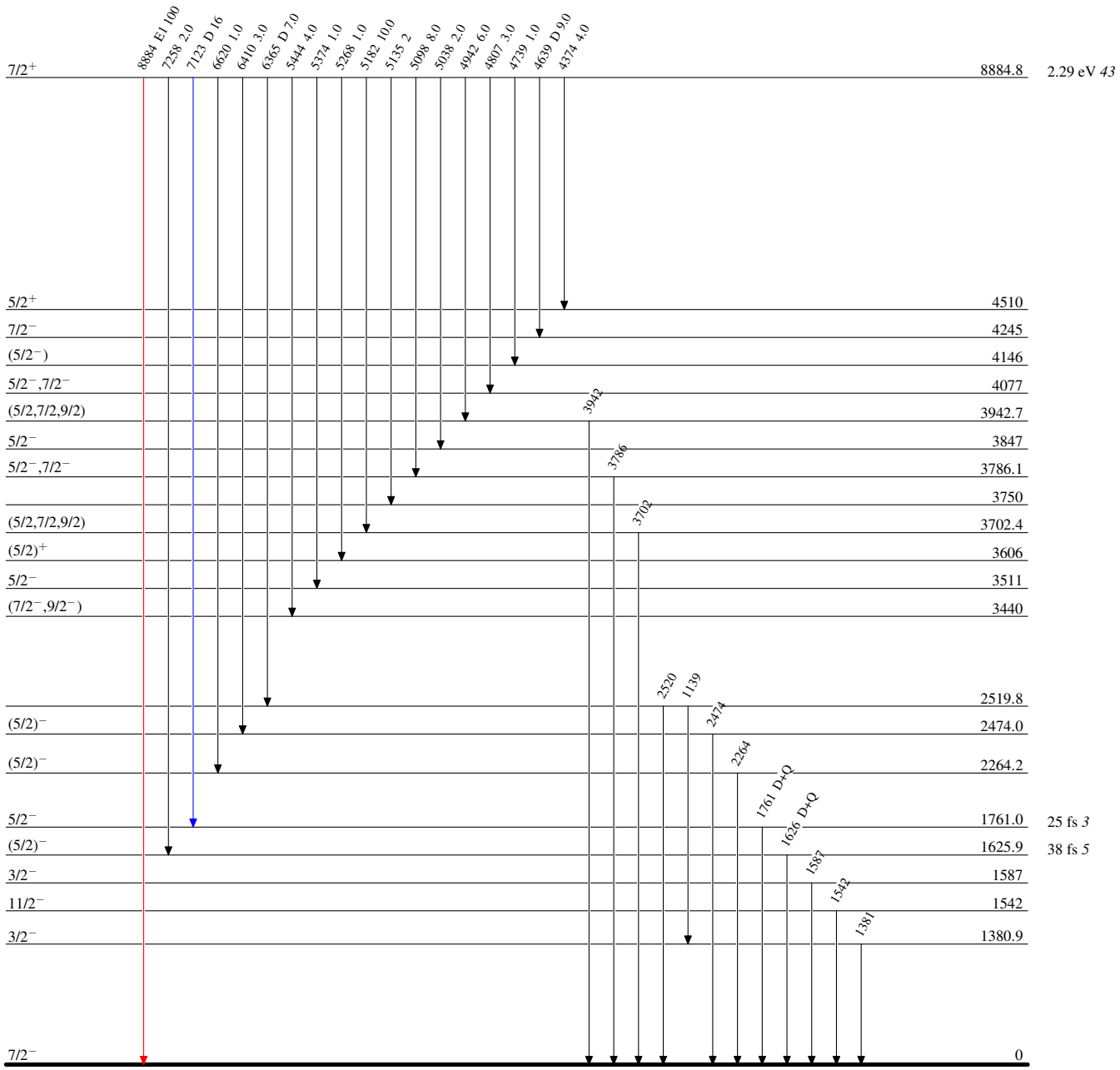
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{49}_{22}Ti_{27}$